

cq-tv

March 1964

Number Twenty

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Fifth Year.

CQ-TV is published for the British Amateur Television Club at 29, Loftin Way, Chelmsford, Essex, and appears quarterly.

The British Amateur Television Club is affiliated to the Radio Society of Great Britain.

CQ



TV

LML

This edition is the first to be printed entirely by the Rotaprint system. General comments received from members as a result of the last edition trial have been unanimously in favour of this style of production, with one or two complaints that perhaps the print size was excessively small. In actual physical size, this print is actually no smaller than fine newspaper print, but the typewriter "face" is, of course, not so legible in small sizes. In any event, the reduction in size has been lessened this time, making the print some 6% larger than in the last edition, and your comments are invited.

Readers will also note that the covers have been cut down to size, upsetting the layout somewhat; however, we have a fair number of the old size covers in stock, and must use them up before reprinting.

The idea of renewing all subscriptions on January 1st seems also to have met with approval, several members having sent in up to three year's subscriptions at once. Normal subscription reminders being sent out with this edition are for the sum of 4/6d only, representing a subscription to cover three issues of CQ-TV only. The Club is still just in the black financially, but only just, and each new member

who joins means an increase in the services we can provide.

Some members will already know that the Post Office is currently overhauling the sound transmitting licence. No final date has been announced for this, and no details have been released. The vision licence is also being replaced, and members are reminded to let the Hon. Secretary know if they are interested in a vision licence not involving a morse test. Any such licence would not, of course, be valid on the lower communications frequencies.

Finally, a word of warning. Due to certain domestic changes at G3CVO - see last edition, PE! - the next edition of CQ-TV may appear very late, or rather early. Similarly, there will be an even longer delay than usual to mail around the end of July and beginning of August.....

Kind regards to you all,

Yours sincerely,


W. Barlow, Editor.

CHELMSFORD MEETING

A BATC Meeting will be held at the Harooni College, Arbour Lane, Chelmsford at 7.45 pm on WEDNESDAY APRIL 18th. There will be a lecture and demonstration of Harooni Image Orthicon equipment, and members will have ample opportunity of examining the gear at close quarters.

There is a good train service from Liverpool St (35 mins approx). The College is 20 mins walk from the station, or buses to Springfield, Witham or Colchester pass the end of Arbour Lane (1½d). Please come if you can; the success of this meeting governs whether or not similar ones can be held elsewhere. In any case here is a fine opportunity of seeing the professional gear - no free samples of Image Orthos, however!

Notes

Back Copies of Nos. 18 and 19 ONLY are in stock @ 1/6d each from GSCVO.

All technical enquiries relating to Station camera tubes should be addressed (with SAK) to J. Russell, 85, Beaufort Rd, Southborne, Bournemouth, Hants.

Technical queries concerning Monoscopes should similarly be sent to Norman Harris, 95, Pave Park Rd, Putney, London SW15. The Hon Sec has passed on all data to these members, so please write direct to them. Order forms for both tubes are still obtainable from GSCVO.

Jim Brinkhill G3MFI, 8 Honeycroft Hill, Chbridge. Mids wants to contact 9.5mm telecine types. 931A and resistor network and base, 8019, 832, 316A and 8019a: offers to William McCann G3PS, "Oakton", Lechlampstead, Newbury, Berks. (Tnt on).

Radiorover make low capacity heater transformers. Self-contained 2m tx 432 o/p incl mod and PSU on 8" x 4" chassis: offers to J. Woodfield G3HEX at 77, Manchester Rd, Wilmslow, Chas. Or will exchange for 700s gear.

Alkathene Film, 11,000" x 24" wide 1/3d yd from Plastics Ltd, 11 Whitworth St, Manchester 1. 100% for sale. Good order, case shabby, £15 or swap for GOOD binoculars. C.E. Santhorne, 136, Fairholme Cres, Hayes Middx.

Microdot mirrors or film making them? Dixon, 25 Eye St, Boro on Eye.

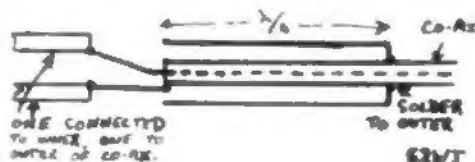
Pressed Ali leaves from your builder: trade name "Indivac", 2/6 each, ask for Ventilators.

SUB, GANE, GATE, 12AT7, 6AL5, 6AL5, 6P60, 6CL80 about 2/- each. Ask May, 20 Whitehall Rd, Leices. Circuits data of SKN498 air-ground TV. 1/6ter.

enSAP available on loan from Russell, address above.

County Cornet Sussex: Messrs. Lord, Manser, Miller, Robinson and Winsted. Contact Lord.

Wanted: CV962/NO14 or CV1581/ACR015 6" CRTs: will exchange for right arm. G3AST 59 Lewsey Rd, Luto. Correction: P5 last edition, Eccles-Jordan switch grids should be returned to a negative rail. The ends of the converter troughs are, of course, metal. Detail of balun below:



FOR DISPLAY AND HOUSING USE: The Hon. Sec has some vivid flame red posters overprinted in black with the large words "Amateur Television". The posters are 30" x 20" and there is plenty of room to add your own details.

Frank Lee suggests the use of 6X6LAs instead of 6X6Vs etc in pulsers; very cheap but 12V heater. ZLQS is asked whether his EP50 o/p valve in his telestill scanner circuit is correct. Meantime, an EP55 will be found less liable to overheat. VIKED finds the signal/noise ratio from his 931As increases in the same proportion as the output signal as the scanner CRT brilliance is increased and this does not depend on the volts/stage. Any ideas?

MANY THANKS to Asst. Editor Fred Steed, who did the better drawings....

Wanted: 4.6 Mc/s PT345 Xtal. GSCVO. (4.5 - 4.7). DON'T FORGET THE TELEVISION SHOW ON ALTERNATE SUNDAYS AT 1430 GMT on 3612 KD/S. There is always someone there to discuss tv with.

SEE YOU AT THE CHELSEAFOED MEETING? APRIL 28th 7.45pm

NEW MEMBERS

Dave Harris 15, Upland Rd, Upton, Wirral, Chas.
J.B. Pallerton 14A, Montgomerie Cres, Saltcoate, Ayrshire.
E. Lambert G3FHI 68, Lower Rd, Botherhithe, SE16.
M.W. Elford 51, Hill Rd, Cheshamford, Essex.
D.P. Shaw 18, Marriott Rd, Maxwell Hill, London N10. Tel Tudor 4159.
J. Keen Rose Cot, Scrubs Lane, Bledlow Ridge, Nr High Wycombe, Bucks.
J. Miller WYER 217, Northway, Baltimore 18, Maryland, USA.
M.S. Page "Leovilla", Boney Rd, Green Point, Cape Town, S. Africa.

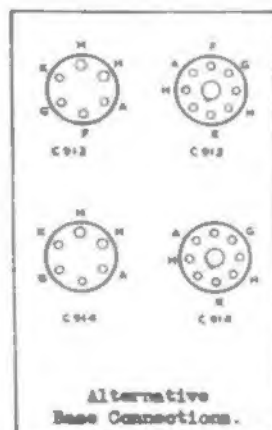
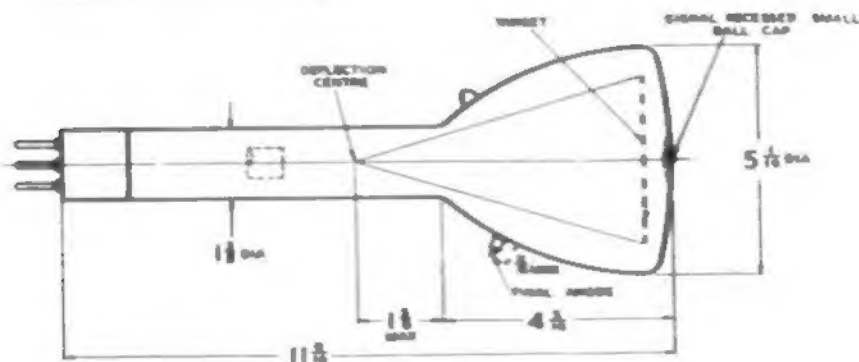
Albert Saunders Saunders Radio Service, 41, Bolton St, Dublin, Eire.
Cecil Dorrity 4, Seaview Terrace, Ailsbury Rd, Dublin, Eire.
W. Stapleton 49, Grace Park Rd, Drumcondra, Dublin, Eire.
J. Profane G3FIA 140, Seafield Rd, Arnos Grove Wll.
G. Planner 164, Aston Brook St, Birmingham
P. Mubling 287 Cleethorpe Rd, Grimsby. (6.
P.C. Visser ZS1EQ PO Box 58, Piketberg, C.P., South Africa. (295)

Changes of Address:

Alan Lord G3DBK 22, Elisabeth Cres, East Grinstead Sussex; Brian Ellis G3GUC 162, Foverel Rd, Cambridge; 2570670 J/T Fox G3HII, 16 Sqdn, RAF Celle, 2TAF BAOR25, Germany.

Monoscope Signal Generator Tubes

OUTLINE DIAGRAM



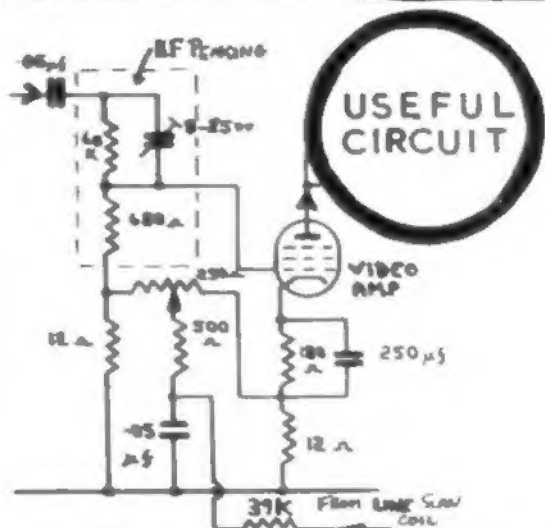
Recommended Operating Conditions

Heater:	6.3V 0.35 amps.
1st Anode:	950 volts.
Final Anode:	1000 volts.
Target:	950 volts.
Control Grid:	15-60V negative.
Beam Current:	0.5-1 microamps.
Signal Current:	0.4-0.7 microamps p-p.
Signal Polarity:	Negative.
Heater-Cathode volts:	60V peak.
Resolution:	Better than 600 lines.
Focus Coil:	200 aspero-turns.

Standard deflection yokes as used in domestic TV receivers can be used, as can standard focus arrangements, but for best results permanent magnet focusing devices are not recommended. The tube should be kept away from stray magnetic fields. It is recommended that a negative HT supply be used, with the target earthed through the load resistor. Type C912 monoscopes are rejected for faulty electrostatic focusing, and these types should be operated with magnetic focusing, the focus anode being joined to the first anode.

As supplied, these tubes are normally Test Card 'C', but other types occasionally available on request (and with possible delay) are patterns: 'S' - a half-tone pictorial subject (Kings College Chapel, Cambridge); 'D' - based on the RMA 325 line test chart; 'T' - a geometric pattern of cubes and definition wedges; 'G' - based on Test Card C, but for 625 lines, and with definition bars up to 5 M/s. Special patterns are made to order, so you might get a "Normal Service Will Be Resumed..." pattern!

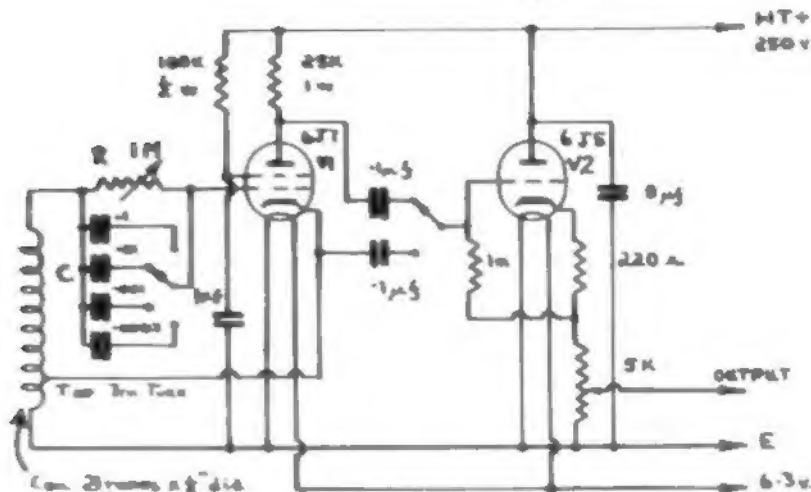
These tubes are available to members of the **RSB** who are resident in the United Kingdom ONLY. The cost is £7-10-0, and order forms may be obtained from the Hon. Secretary. No correspondence is allowed with the manufacturer; all technical enquiries should be addressed with SAE to Norman Harris, at 95, Pave Park Rd, London SW16.



Here is a useful circuit for 5527 fans and others troubled with shading of the picture. Grant Dixon called it from Pink, P671 and can recommend it; by increasing condenser C to about 2 mfd, and using the vertical coils, vertical shading can be produced.

A UTILITY PULSER

By FRANK LEE.



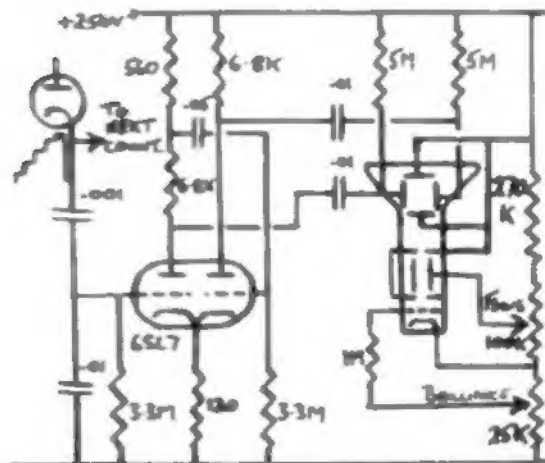
Many members will have felt the need for a simple pulse generator for general testing purposes. Here is a simple unit capable of giving a short pulse of either polarity at any frequency between 5 a/s and 50 ka/s. The circuit is given below.

V1 is a Hartley oscillator running at about 25 ka/s; its grid circuit components R and C are chosen to cause it to act as a Blocking Oscillator. A large negative pulse of some 90 V peak-to-peak is obtained at the anode of V1, and

a smaller positive pulse at the cathode. V2 is a cathode follower to isolate the output. The pulse frequency varies with the time constant of C and R, being roughly given by:

$$t = 1.6 CR.$$

For a given CR product, a higher value of R will give a longer pulse duration. The pulse frequency is reasonably independent of HT variations, and is given approximately in the table. The valve types are not at all critical.

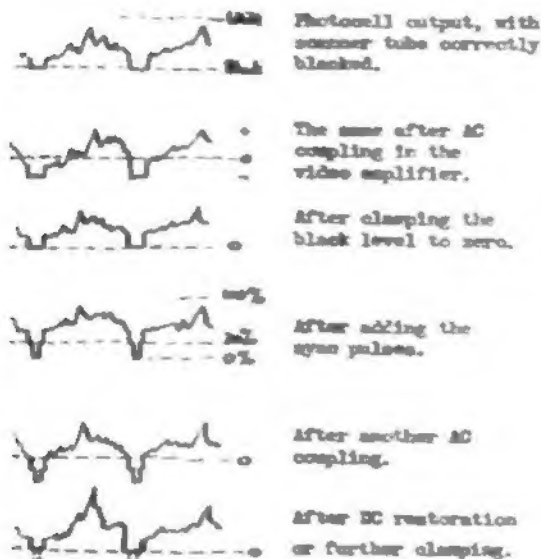


A SIMPLE COUNTER-CIRCUIT MONITOR UNIT

When setting up counter circuits, it is almost essential to check the counts with some visual indicator, such as a CRO. However, a useful monitor can be built into the pulser in the manner shown. The input to the 6SL7 is taken from the counter output; the circuit shown is for a multivibrator counter using diode coupling but the principle can be extended to other types of counter. Push-pull output is obtained from the 6SL7, and this consists of an amplified "stair-case" waveform, originally present at the cathode of the diode. This is applied to the X plates of a small 1" or 2" CRT, the Y plates being taken to the 3rd anode. A series of elongated spots in a straight line are seen on the CRT screen, the number of spots being the same as the number of "stairs", and hence the same number as the count-down ratio. Reference: Pink, "TV Engineering".

THAT D.C. COMPONENT

Members will already be quite familiar with the application of DC restorers to television receivers, although it may not be quite so clear as to how we go about retaining the "D.C. Component" in the transmitter, nor even, perhaps, just why we bother about it at all. First then, remember that if any two valves in an amplifier are coupled by a condenser in the usual way, the DC is blocked, and the AC appearing at the grid of the next valve adjusts itself so that the areas of the waveform above and below zero level are equal. In our case this means that all scenes are reproduced with the same average level of illumination, which is governed by the setting of the receiver brilliance control. No matter whether the studio lighting engineer has all his lights on, or is doing some crafty night effects, the viewer will see no difference in his picture, and a great deal of realism can easily be lost. This is particularly important for closed circuit studio work.



If we could ensure that some portion of the vision signal, say black, was always at some particular level at the receiver CRT, then we could set the brilliance control and then leave it alone; any further changes in brilliance would then be entirely due to the transmitted signal, provided this transmitted signal contains the information necessary to establish this Black Level.

The DC component is introduced at the transmitter by taking a signal that is known to be black - such as the output from a flying spot unit when the camera is completely blanked out during flyback - and arranging this Black signal to occur always at the same potential in the video output waveform. This is done by a clamp circuit, as shown in the diagram. Once this has been done, ordinary DC restoring diodes can be used to obtain the same effect, since they can be arranged to conduct during the black portions and so return the black level to earth. It is better to do this after the sync pulses have been added, as otherwise the diode is required to conduct on black but be cut off on dark grey - which will be very difficult for it with normal valve tolerances. However, mixing the sync pulses introduces a further complication, as it is essential to retain the relative levels of sync, black and white signals at zero, 30%, and 100% carrier respectively. If the vision waveform is examined on an oscilloscope, and there is 1 v peak to peak amplitude visible, we must ensure that 0.3 v of this is sync, and 0.7 v is signal. The division between the two is the black level; the sync pulses are negative with respect to this and the picture signal positive, for what is termed a "positive-going" signal. It is at once apparent, therefore, that the Black Level must be clamped or restored immediately before ANY pulses are added to the waveform. (If this is not done, the equal-area principle occurs again). The waveform will make this clearer.

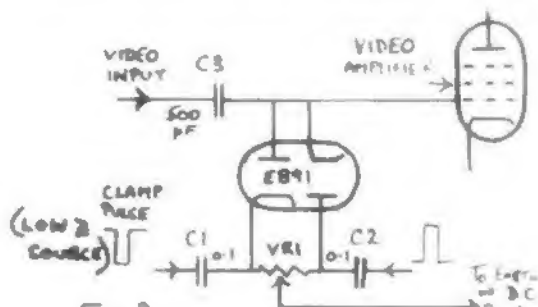


FIG 2

A very effective clamp circuit, originally given in "CQ-TV" no. 15, is shown in Fig 2. For effective operation, the condensers C1 and C2 should be at least 50 times as big as C3, but as no grid leak is used, C3 can be quite small without causing a deterioration in the LP response of the amplifier. The clamp pulses in professional equipment occur during the back porch of the blanking period, but for amateur work the line sync pulses will do very nicely. VR1 sets the level to which the grid is clamped.

WHAT THE OTHER FELLOW IS DOING....

By JIMMYE McFINDLESMOOTH

Normal Service
will be resumed as
soon as possible

Hallo, there! Your Editor has given me some more space this month, so lets get right in with the reports.

Here's an interesting one from G. Plummer of Birmingham, who is the brother of GAVEL. This one suffers from bad health, and cannot at the moment get his own ticket. However, closed circuit tv is well advanced; his interlace is produced by shock exciting the 20250 cps tuned circuit with frame pulses (shades of GERTI!), and then counted down. At the moment there is some jitter due to the frame pulses refusing to lock to the mains. Also in use is a 9.5mm telecine scanner - can we have more details, and? There are hopes of a Vidicon, too. And complaints of lack of activity in 3" beam area.... ENJOY

D. E. SAUNDERS (Beymouth) has been doing his Radio Amateur's exam. Good luck, oh. Allen TYRONE (Newbury) has a 405 line telestill unit with AGN1 and 931A under construction, and hopes to include telecine and live gear later. George HAYLOCK (SE15) is now Hon Sec of the BROC and Chairman of the RABC in addition to his other activities. Anthony BAKER (Woodford, Ches) has exams coming up in the summer, but very kindly offers help in between times... J. A. JEFFRIES (Oxford) has had a visit from Grant Dixon, and says he is now "much wiser"! The 70cm tx using QJ806/40s is now complete, but during the cold spell one of the seals gave out....

A. P. HARTING (MR. HELPY) has a been squashed at work, and they hope to do something in the Canal Zone. A telestill unit and the necessary pulsing gear is under construction. Two radio fall of gear is planned eventually. Dave DOOPER STU (NW10) is rebuilding his 3FFV telestill scanner, and has ideas on a Station camera. BW-wise he is still dormant, but has an AML and HP102A unit to hand. Johnny WOODFIELD (Walslow) is going next year at Manchester University, but has not yet met GERTI. His tv activities are at a stand-still whilst a) work is done and b) the 3s gear is overhauled. John also wants to get on 70 cm, but finds gear scarce up there; he is also getting a car. Now, this we MUST see....

Our friend Gianfranco SEMIGLIA ILBBI (Bologna) has his 17" tv rx in operation now. Giorgio PASQUALI has been doing some work with surplus CV79 magetrons, and continues his V.F. activities. Don DAVIDSON (Ottawa) wants some 1 - 1.5cm magnetrons or data, new or surplus. It must be catching! J. A. HEDDES (Greenford) has just moved house, and so has had to dismantle the rig temporarily. Rebuilding shortly. John ANGLIN (W42Z) (Trisby) has a 405 line pulser working, and has now received his Station camera tube. John is anxious to meet other TV-ers in the area. ??

Hendrik de WAARD PABEX (Groningen) is by now in Sweden, where he is working for several months. He adds a few notes to the tale of the Jeep-borne TV tx mentioned previously and illustrated in Wireless World. The 5527 camera was mounted on a tripod in the Jeep; it uses a binocular optical viewfinder. The 70cm link tx was on 432Mc/s, with a QJ803/20 power trebler in the final running at 15 watts. Grid and screen modulation is used, with sound on a 5.5Mc/s subcarrier added to the 5Mc/s video. The converter (up a church tower) was a simple 6J6 and 6J6 mixer in Lecher lines affair, made by PABEX. This fed the video signals to the main 3s tx. The Jeep took a 700 watt motor generator in a trailer, covered in leaves to deaden the noise! An 80m service channel was in use, and pictures were relayed as the Jeep drove slowly through the streets of Groningen. Since then, the gear has survived a fire in the storage shed, and although covered in tar, still works. Hendrik is at the moment very busy writing his thesis on something quite incomprehensible to do with radioactivity, and a "spherical square well". Any takers?

Ron RADIE (Glasgow) is very busy professionally, but has managed a 12" and most of a 17" rx, plus $\frac{1}{2}$ of a caravan! He says he thinks tv tx activity in Scotland is zero. Come now, we know of at least one telestill unit - I think... Ray HILLS (Harrow) is making the G3GDR converter. Bill HOWARTH (Ches) has received his monoscope; Alan LORD GUNER (S. Grinstead) has now moved house and is back on construction, 70cm and tv, again. Frank MAY (Leicester) has got his monoscope and station, and has the pulser partly built. He enquires what coils are used in the pulser described in the Oct. 53 CQ-TV. Well, one, a bit of elementary AC calculation will give the right values, or you can pick a condenser and run thro' your stock of old coils, using the WFO and tuning the beat note against the piano! Very handy for LF frequencies in the absence of test gear!

Two of our regular stalwarts are now away doing their National Service. IAN WATERS (Kly) came back from a business trip to Cairo, and is now an AGI in the RAF near Lincoln. JEREMY BOUTIN (Dunow) is at the Army School of Surveying at Westbury in Berkshire. He manages to get home at frequent intervals to help RALPH GZNU/T with the camera gear. Ralph's new high power 70cc TV tx is now in operation, running 40 watts input to an air-blown G3806/40. The signal strengths in the London area are now considerably increased, and on one occasion G2BKJ at Leicester - 100 miles away - received a strong enough signal to resolve test bars perfectly satisfactorily. Unfortunately without Jeremy, Ralph was unable to use the camera but on several occasions when all the GZNU crew have been at home, viewers such as G3GGR at Rhote Langley (35 miles) have been taken on a conducted tour of the GZNU QTH. Duplex phone working has greatly added to the enjoyment. The vision carrier is on 436 Mcs, and the sound on the 145 Mc/s band. With a new length of camera cable, trips round the garden are being arranged for the summer!

L. E. PROFFER G5PTA (Nll) is organising a Radio Exhibition in N. London at the end of July, and hopes to give the BANC a corner. Robert BUCHANAN (Bewerk) is "still pottering" with the telestill unit, but his medical studies are now severely curtailing his spare time. Frank LEE (Beverley) is building the ZLJ/S pulser using 718Cs in the counter chain. He's also working on a circular time base calibrator device. Ian KACHINCHER G3KRI (Bewchester) complains of variable definition along lines in his camera tube, getting 3 1/2 u/s at one side and only 2 at the other. Any offers? Ian hopes to televise an amateur dramatic group to help their rehearsals. Work on colour TV goes on. G. M. DAVENPORT (Hayes) has had his pulser not published in Electronic Engineering. He says that G3GTS/T has made several test transmissions on 427Mc/s, generally on a Tuesday evening, but to date no regular schedule has been announced. Norman LINDIE (SW15) and Peter HAYNE (Chelsea) have seen the light and are collaborating. A new pulser and telestill unit (with G3C71 scanner - shortly to be replaced by a 5FF9) are in action, and a microscope is to hand. Norman has kindly offered to look after the Microscope rev, see P2. J. B. FILLANTON (Saltcoats) has the telestill unit running fairly satisfactorily, but is troubled by clipped suppression pulses somewhere. He has tried reflection scanning with the AGI but finds the pictures very weak. He uses a 2 x 2 test card C stuck on the face of the tube, and the 231A at 10° range, as recommended.

Borje Cedarqvist G3ZKL (Helsinki) has most of the Vidicon circuitry completed, but is not quite sure where the tube is to come from! He wants to harrow all the gea, Jim Russell! Grant

DIXON (Ross) sends in his usual comprehensive report. He was unable to afford an SW1A/35, and so is still stuck for a 5" magnetic tube. He EXCLY required for his colour experiments. That he white face. Colour rendition is now pretty good, and Grant finds the colour balance is better checked on the monitor scope than by eye! Some hum still causes trouble, but the "true non-linearity was cured by a Maynes transformer in the camera. Grant asks WHAT the other colour people are doing; demonstration given in return for correspondence! Grant says that he has now done the donkey work on his gear, and only the details remain to be perfected.

BILL STAFFERTON (Dublin) writes in to say that the Irish Amateur TV Club is temporarily in abeyance, although at least three of the lads are very active. Time being limited, Bill is building up his gear a unit at a time, and hopes to have a 405 line camera chain and slide scanner in operation. Bill and the lads send their warm regards to George SHOOT (K. Beckington, Lincs).

ERIC CORNELIUS VK6HC (Wagin, W. Australia) is hundreds of miles from the nearest TV amateur, but is highly enthusiastic. His job is with the ABC station GWA (10kW on 560 kn/s), but he thinks there cannot be more than half a dozen active TV experimenters in VK. His own gear runs 84 tubes in a flying spot scanner (VCR112 at 5 kV), OCIV standard waveform generator, mixers, picture and waveform monitors (VCR97s and 139s) and video rx with a 5BPL. White screen tubes, and magnetic tubes and deflection components are virtually unobtainable, hence the VCR97s. Standards are 245 line 25 picture double interlaced at present, but if suitable CRTs become available, a 625 line system will be used.

TONY SALE (Rayleigh, Essex) is now fully settled in at his new home, and has been neglecting the garden to get the TV gear in operation again. A new pulse generator, camera amplifier and 70 cm converters have all been constructed in the last few months, and several tests have been made with GZNU to receive his TV pictures. G3CVC/A is on the air from the same house to provide RT communication. So far, the tests have not been very successful, but a new aerial is being installed for which GREAT THINGS are prophesied; the garage, meantime, lacks some vital supports...

John FLOWMAN G5AST (Luton) is MAD about gas tetrodes for linear scans - type 2050, 1/- and good. The new gear, Flowman PB finish, plated etc is well on the way. Robert TORPES G3SFF/T (N.I.) has been working on various types of video maps.

And that's it for this month, men. Keep send sending in your news, especially reports of 70cm reception of G2NU/T or G3GTS/T (or others!). ACc

